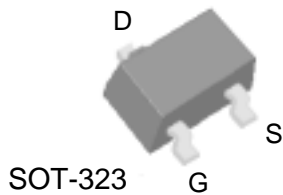


N-channel Enhancement-mode Power MOSFET

PRODUCT SUMMARY

BV_{DSS}	50V
$R_{DS(ON)}$	3Ω
I_D	250mA

 **Pb-free; RoHS-compliant SOT-323**



DESCRIPTION

The SSM7002EGU achieves fast switching performance with low gate charge without a complex drive circuit. It is suitable for low voltage applications such as small converters and general load-switching circuits.

The SSM7002EGU is supplied in a RoHS-compliant SOT-323 package, which is widely used for low-power commercial and industrial surface mount applications where a small footprint is required.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Units
V_{DS}	Drain-source voltage	50	V
V_{GS}	Gate-source voltage	± 20	V
I_D	Continuous drain current ³ , $T_A = 25^\circ\text{C}$	250	mA
I_{SD}	Source-drain diode current	115	mA
I_{DM}	Pulsed drain current ^{1,2}	1.0	A
P_D	Total power dissipation ³ , $T_A = 25^\circ\text{C}$ $T_A = 75^\circ\text{C}$	200	mW
		120	mW
T_{STG}	Storage temperature range	-55 to 150	°C
T_J	Operating junction temperature range	-55 to 150	°C

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Maximum thermal resistance, junction-ambient ³	625	°C/W

Notes:

1. Pulse width must be limited to avoid exceeding the maximum junction temperature of 150°C.
2. Pulse width <300us, duty cycle <2%.
3. Mounted on FR4 board

ELECTRICAL CHARACTERISTICS (at $T_j = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-source breakdown voltage	$V_{GS}=0V, I_D=10\mu A$	50	-	-	V
$I_{D(ON)}$	On-state drain current	$V_{DS}=7V, V_{GS}=10V$	500	-	-	mA
$R_{DS(ON)}$	Static drain-source on-resistance	$V_{GS}=10V, I_D=250mA$	-	-	3	Ω
		$V_{GS}=5V, I_D=50mA$	-	-	4	Ω
$V_{GS(th)}$	Gate threshold voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	2.5	V
g_{fs}	Forward transconductance	$V_{DS}=7V, I_D=200mA$	80	-	-	mS
I_{DSS}	Drain-source leakage current	$V_{DS}=50V, V_{GS}=0V$	-	-	1.0	μA
I_{GSS}	Gate-source leakage current	$V_{GS}=\pm 20V$	-	-	± 100	nA
$t_{d(on)}$	Turn-on delay time ²	$V_{DS}=30V$ $I_D=100mA$ $R_G=10\Omega, V_{GEN}=10V$	-	7.5	20	ns
t_r	Rise time		-	6	-	ns
$t_{d(off)}$	Turn-off delay time		-	7.5	20	ns
t_f	Fall time		-	3	-	ns
C_{iss}	Input capacitance	$V_{GS}=0V$	-	19	50	pF
C_{oss}	Output capacitance	$V_{DS}=25V$	-	10	25	pF
C_{rss}	Reverse transfer capacitance	$f=1.0MHz$	-	3	5	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward voltage ²	$I_S=115mA, V_{GS}=0V$	-	0.76	1.5	V

Notes:

1. Pulse width must be limited to avoid exceeding the maximum junction temperature of 150°C .

2. Pulse width $<300\mu s$, duty cycle $<2\%$.

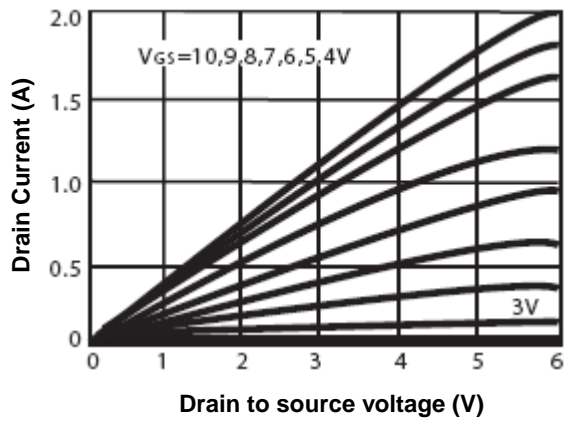


Fig 1. Typical output characteristics

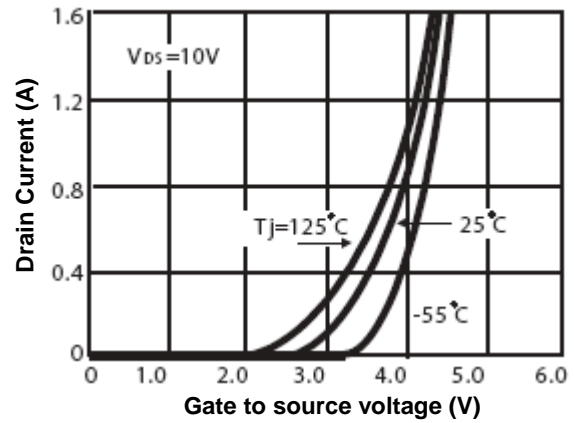


Fig 2. Typical transfer characteristics

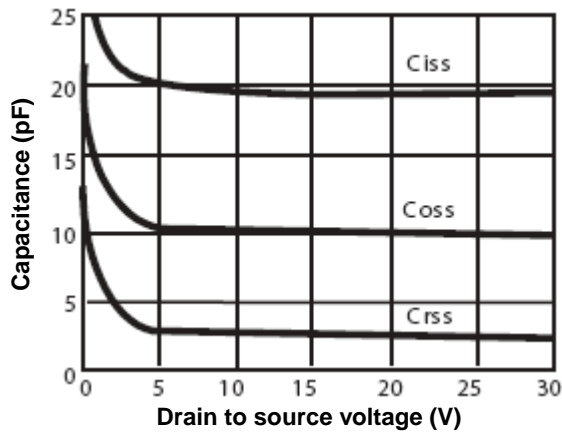


Fig 3. Typical Capacitance

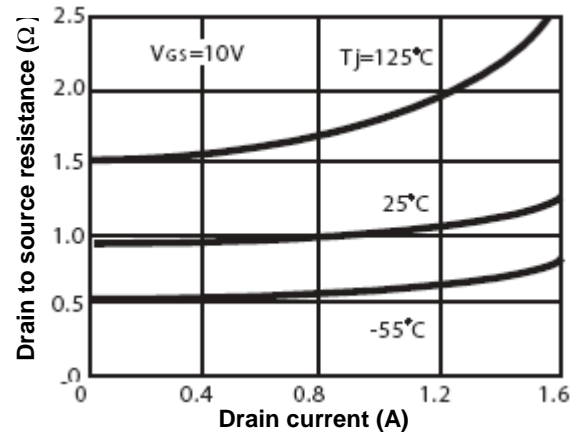


Fig 4. Normalized on-resistance vs. junction temperature

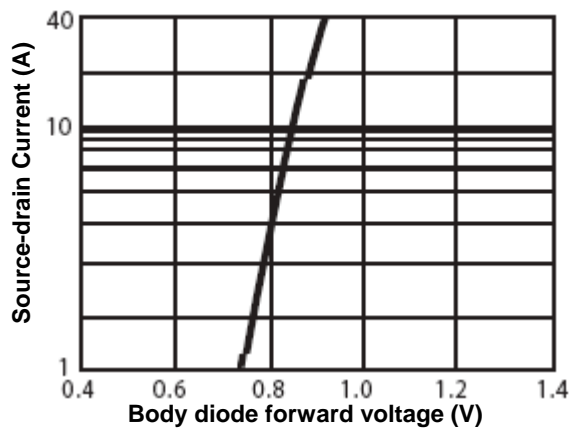


Fig 5. Forward characteristics of the reverse diode

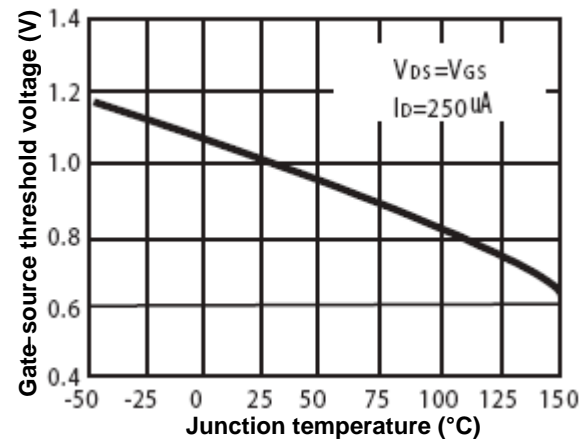


Fig 6. Gate threshold voltage vs. junction temperature

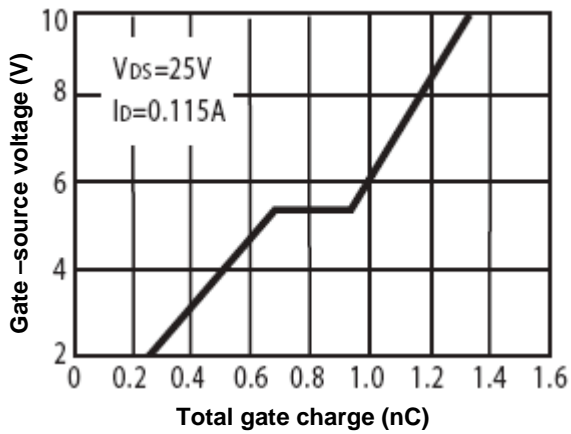


Fig 7. Gate charge characteristics

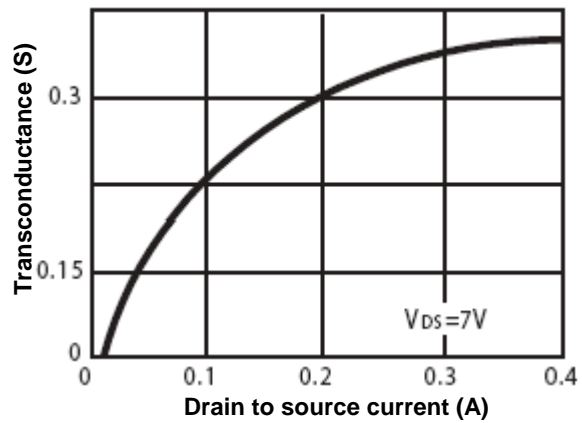


Fig 8. Typical transconductance

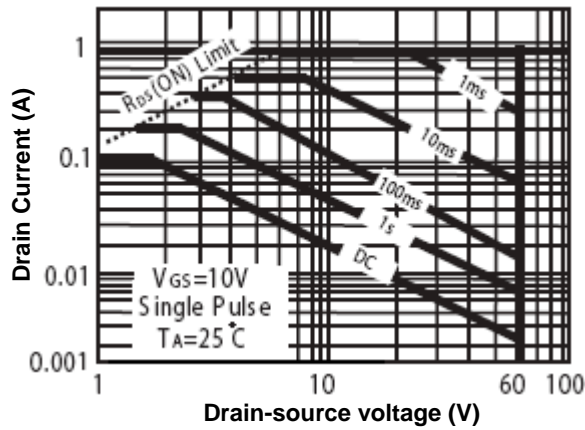


Fig 9. Maximum safe operating area

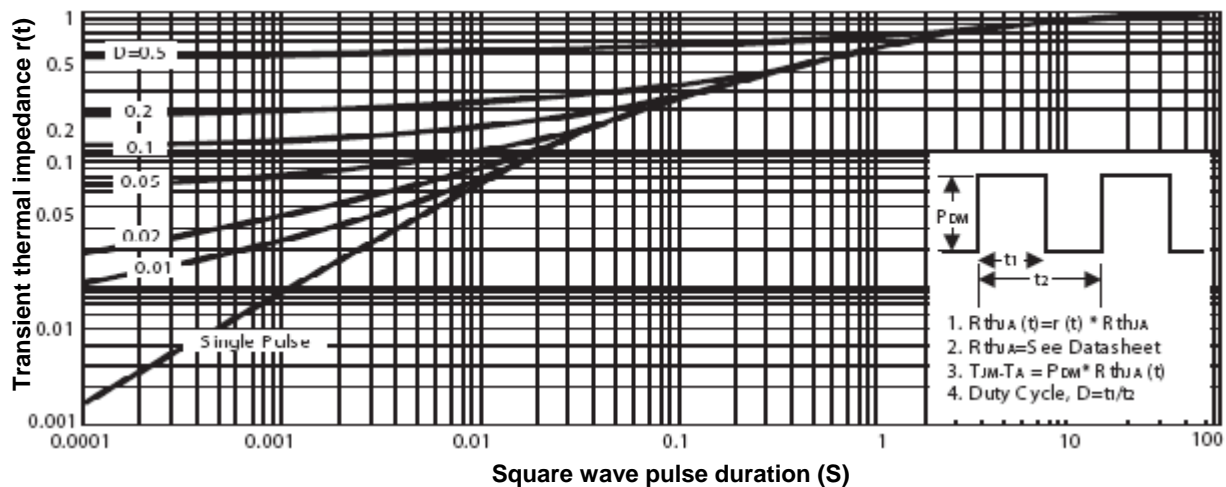
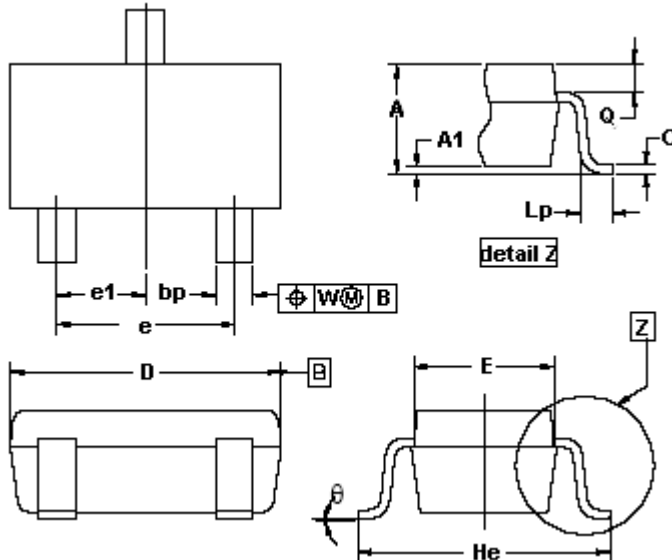


Fig 10. Normalized Transient Thermal Impedance

PHYSICAL DIMENSIONS
SOT-323


SOT-323 DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.10	0.0315	0.0433
A1	--	0.10	--	0.0039
bp	0.30	0.40	0.0118	0.0157
C	0.10	0.25	0.0039	0.0098
D	1.80	2.20	0.0709	0.0866
E	1.15	1.35	0.0453	0.0531
e	1.30	--	0.0512	--
e1	0.65	--	0.0256	--
He	2.00	2.20	0.0787	0.0866
Lp	0.15	0.45	0.0059	0.0177
Q	0.13	0.23	0.0051	0.0091
W	0.20	--	0.0079	--
ϕ	10°	--	10°	--

PACKING: Moisture sensitivity level MSL3

3000 pcs in antistatic tape on a reel packed in a moisture barrier bag (MBB).

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